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(12) **United States Patent**
McCall et al.(10) **Patent No.:** **US 6,321,984 B1**
(45) **Date of Patent:** ***Nov. 27, 2001**(54) **ADJUSTABLE PRICE FUEL DISPENSING SYSTEM**(75) Inventors: **Don C. McCall**, Cedar Park; **Dave Embertson**; **Mike Zahajko**, both of Austin, all of TX (US)(73) Assignee: **Dresser Equipment Group, Inc.**, Carrollton, TX (US)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/255,472**(22) Filed: **Feb. 23, 1999****Related U.S. Application Data**

(63) Continuation-in-part of application No. 09/026,634, filed on Feb. 20, 1998, now Pat. No. 6,112,981.

(60) Provisional application No. 60/039,007, filed on Feb. 25, 1997.

(51) **Int. Cl.⁷** **G06K 5/00**(52) **U.S. Cl.** **235/381; 235/380**(58) **Field of Search** 235/381, 375, 235/470, 493, 383, 382, 382.05, 380(56) **References Cited****U.S. PATENT DOCUMENTS**

3,660,858	5/1972	Smith, Jr. .	
3,786,421	1/1974	Wostl et al. .	
4,199,100	4/1980	Wostl et al.	235/381
4,345,146 *	8/1982	Story et al.	235/381
4,396,902	8/1983	Warthan et al.	382/64
4,469,149 *	9/1984	Walkey et al.	141/94
4,723,212	2/1988	Mindrum et al. .	

4,881,581	11/1989	Hollerback .	
4,910,672	3/1990	Off et al. .	
4,914,279	4/1990	Massey	235/449
5,056,019 *	10/1991	Schultz et al.	364/405
5,173,851	12/1992	Off et al. .	
5,260,552	11/1993	Colbert et al. .	
5,327,066 *	7/1994	Smith	320/2
5,336,871	8/1994	Colgate, Jr.	235/380
5,340,969	8/1994	Cox .	
5,393,966	2/1995	Gatto et al.	335/440
5,422,744	6/1995	Katz et al.	359/2
5,506,395 *	4/1996	Eppley	235/486
5,514,858	5/1996	Ackley	235/462
5,531,482	7/1996	Blank .	

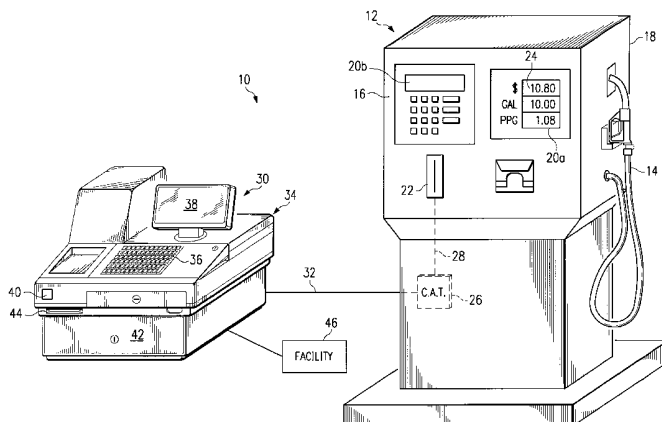
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FOREIGN PATENT DOCUMENTS

4013147	10/1991	(DE)	B67D/5/14
0114447	8/1984	(EP)	G07F/7/02
7-200754	8/1995	(JP) .	
9-251521	9/1997	(JP) .	
96/42061	12/1996	(WO)	G06F/17/60
94/09457	4/1994	(WO)	G07F/13/02

Primary Examiner—Thien M. Le(74) *Attorney, Agent, or Firm*—Haynes & Boone, L.L.P.(57) **ABSTRACT**

An integrated customer reward processing system and fuel dispensing apparatus to allow a retailer to authorize fuel to be dispensed at a discounted unit price in accordance with a customer's achievement of predefined purchasing criteria. More particularly, a data processing system is provided that implements customer rewards and includes a database that creates and maintains records associated with customers that make purchases at an associated store. The reward system will track the customer purchases and compare them with a predefined criteria to determine when a fuel discount is to be provided. When a customer meets one of the predefined criteria, the reward system will authorize a fuel discount and provide the customer with a mechanism to obtain the fuel at a discounted unit price.

15 Claims, 7 Drawing Sheets

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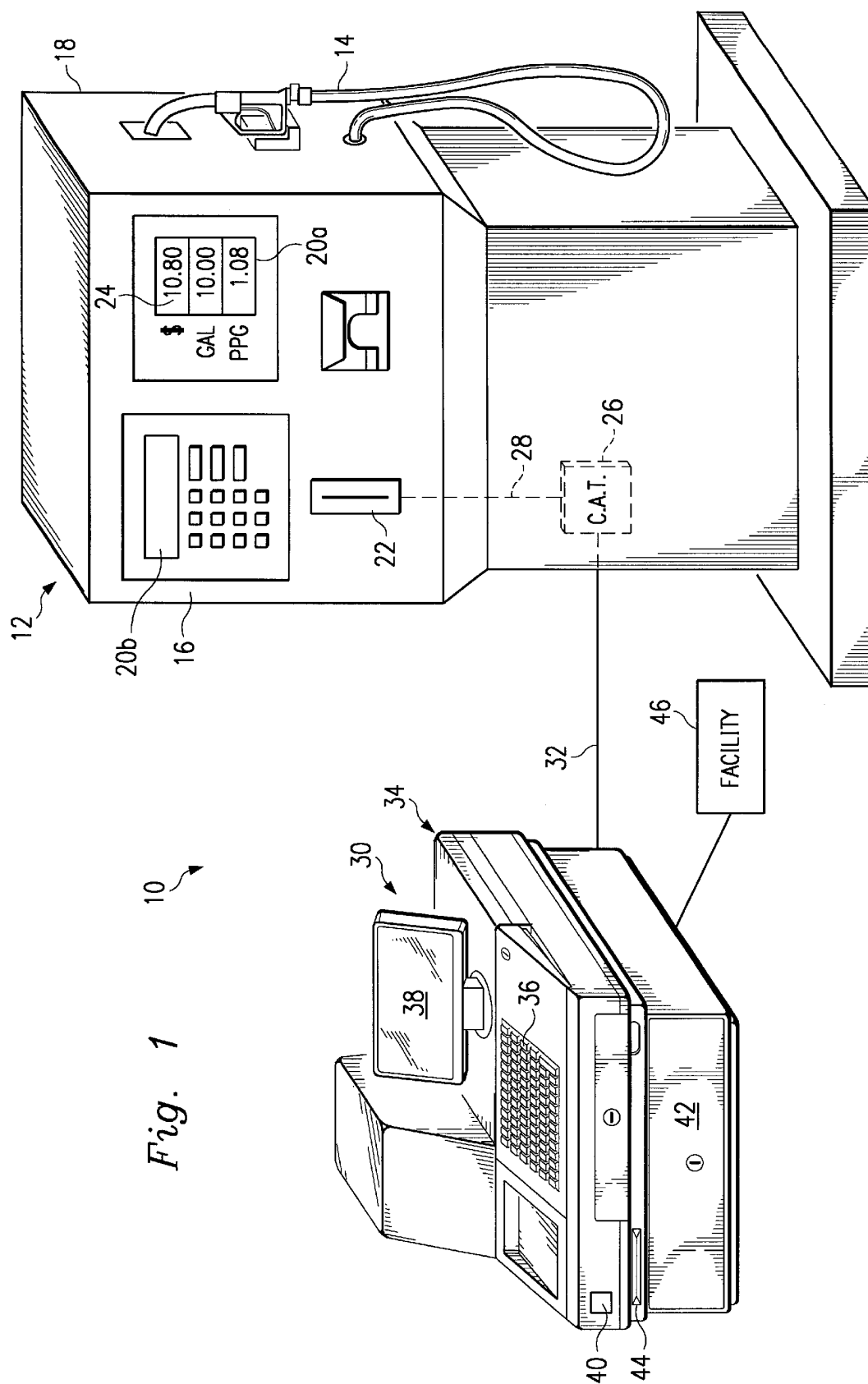
U.S. PATENT DOCUMENTS			
5,545,883	8/1996	Sasou et al.	235/449
5,548,106	8/1996	Liang et al.	235/454
5,602,745	2/1997	Atchley et al. .	
5,612,868	3/1997	Off et al. .	
5,679,945	10/1997	Renner et al.	235/492
5,700,999	12/1997	Streicher et al.	235/381
5,729,002	3/1998	Samples	235/462
			* cited by examiner
		5,822,735	10/1998 De Lapa et al. .
		5,832,457	11/1998 O'Brien et al. .
		5,895,457	4/1999 Kurowski et al. .
		5,901,303 *	5/1999 Chew 395/400
		5,913,180 *	6/1999 Ryan 702/45
		6,062,473	5/2000 Blalock et al. 235/381
		6,112,981	9/2000 McCall 235/375

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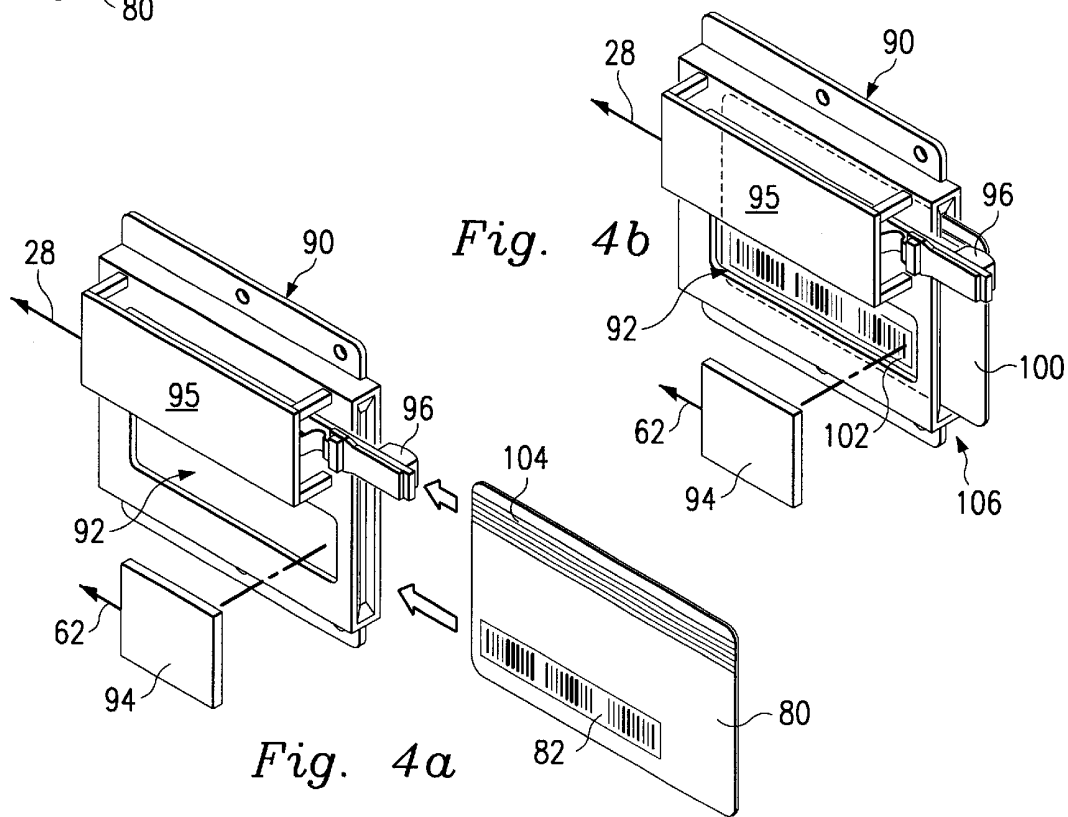
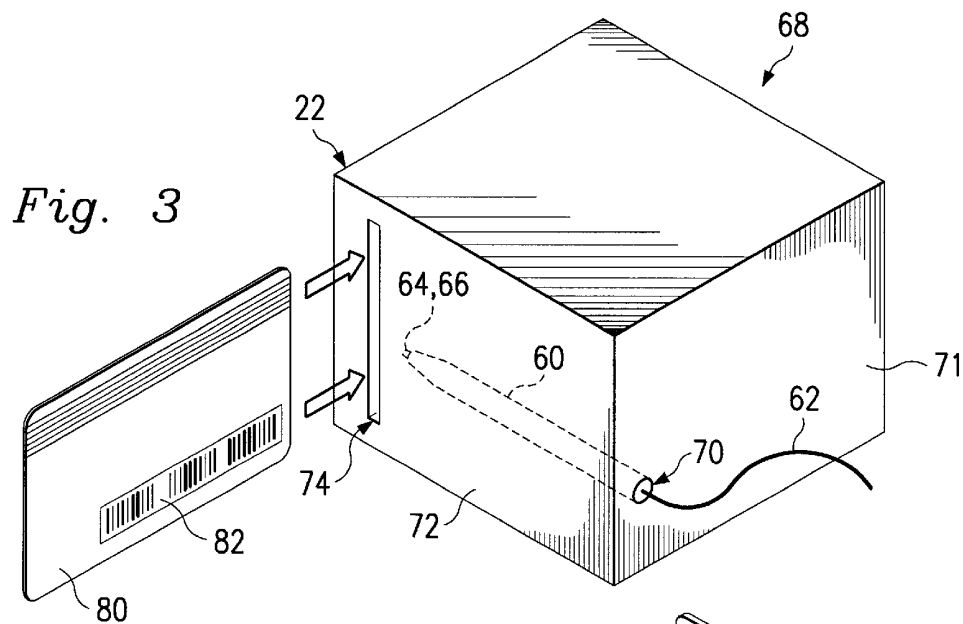
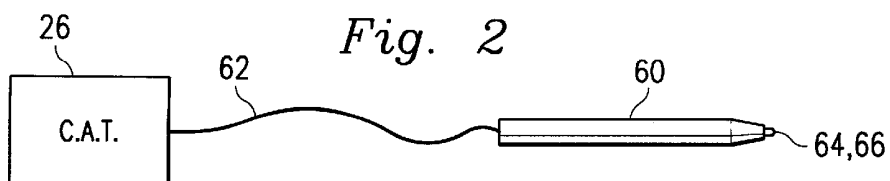


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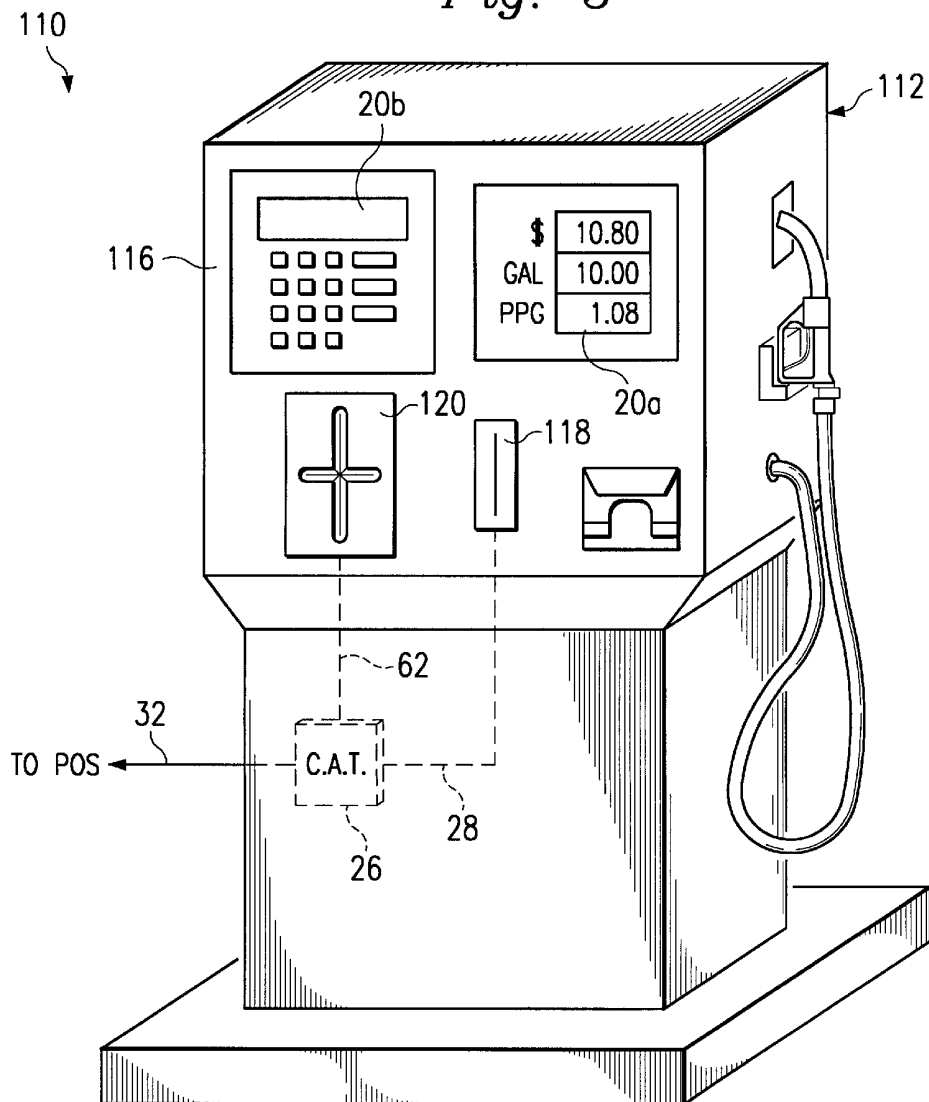
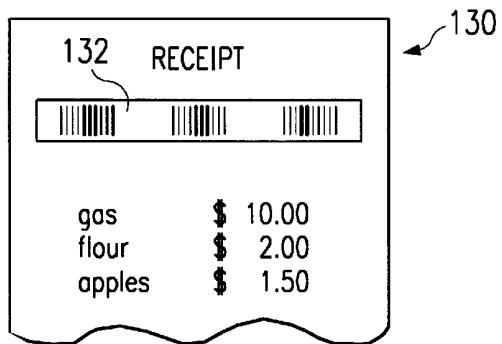


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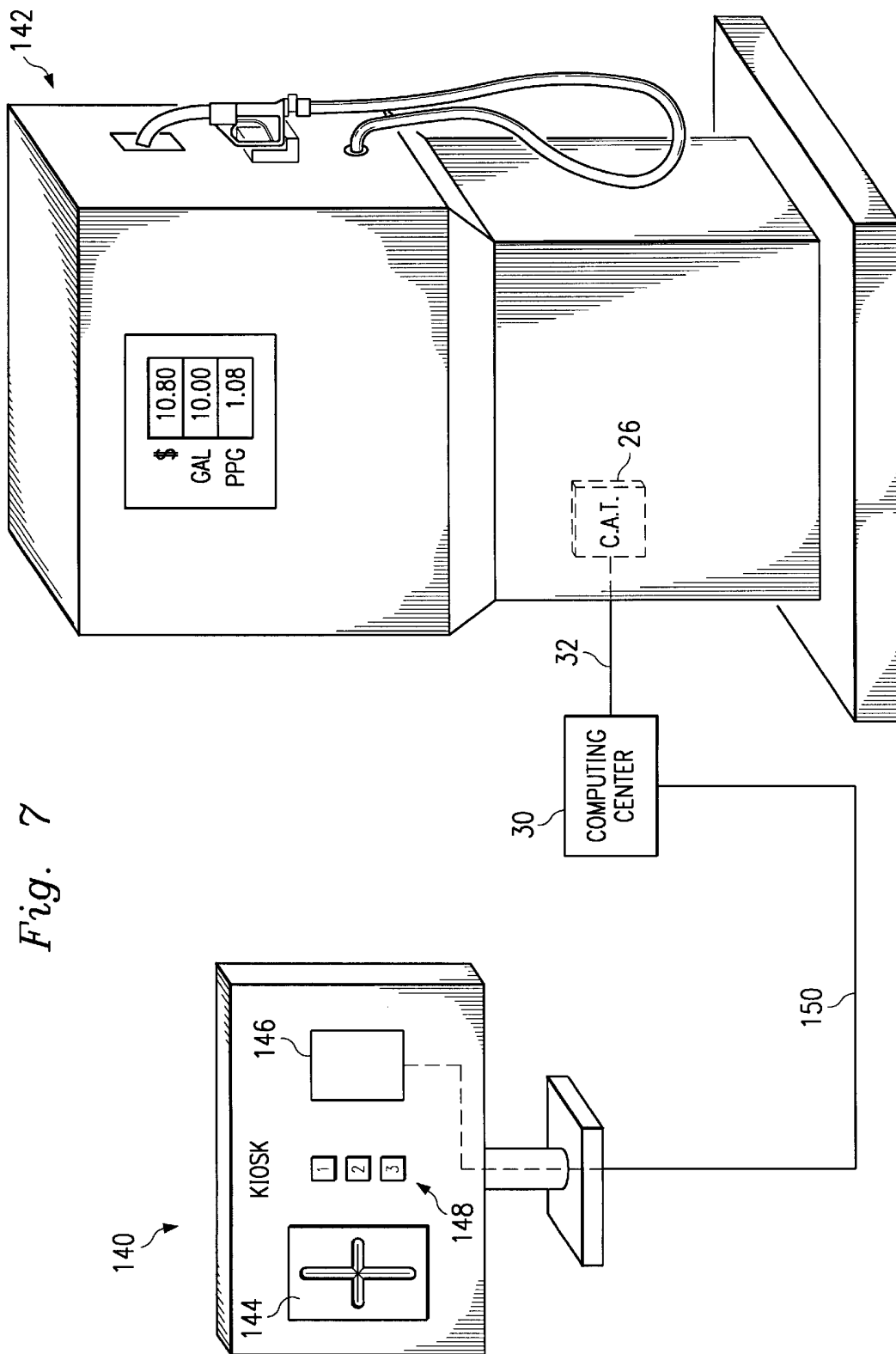
Fig. 5*Fig. 6*

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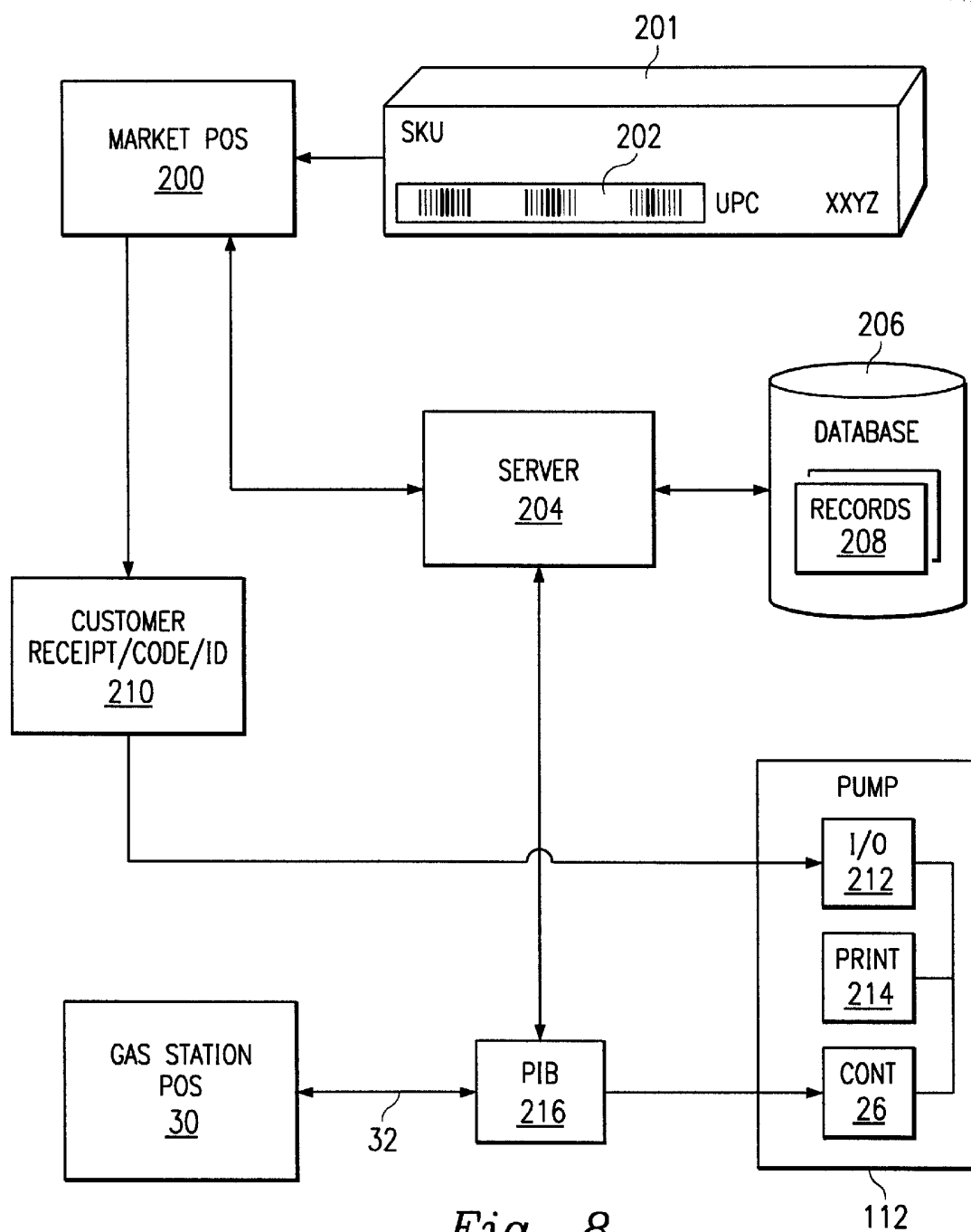
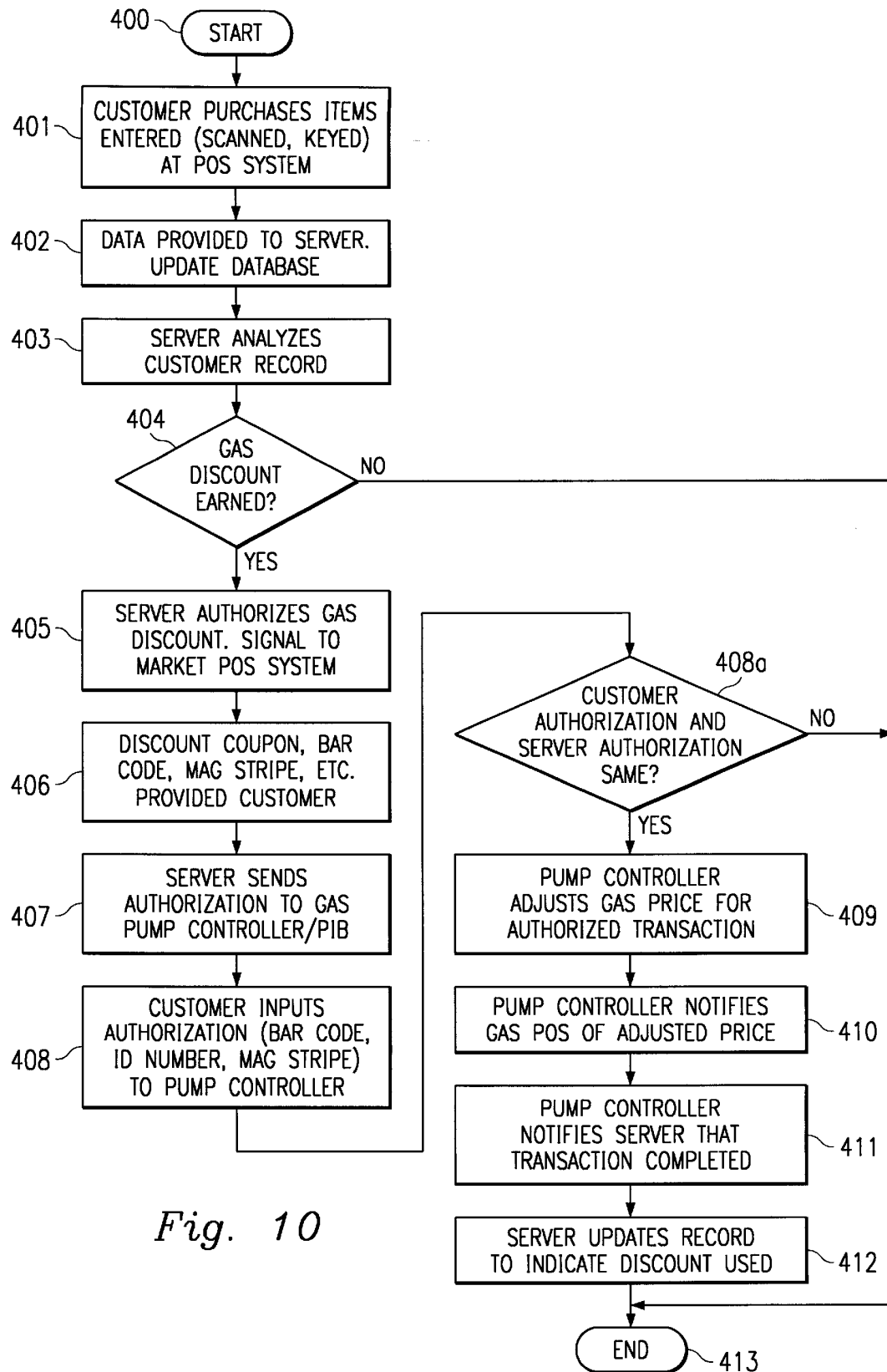
*Fig. 8*

Fig. 9

300	SMITH, A ID NO. 1234ABC						
	DATE <u>302</u>	PURCHASES <u>304</u>	QUANTITY OF DESIGNATED ITEMS (PROMO) <u>306</u>	TOTAL QUANTITY (LOYALTY) <u>308</u>	DISCOUNT <u>310</u>	DISCOUNT USED <u>312</u>	DISCOUNT AMOUNT <u>314</u>
	1/5/99	20\$	3	5	N		
	1/17/99	15\$	5	10	Y (≥ 5 PROMO)	1/20/99	10¢/GAL
	1/28/99	45\$	2	4	N		
	2/4/99	25\$	1	3	Y (>20 LOY) Y (>100\$)		10¢/GAL } 15¢/GAL } 25¢/GAL
208							
	TOTAL	\$105	11	22			
		316	318	320			

*Fig. 10*

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**ADJUSTABLE PRICE FUEL DISPENSING
SYSTEM****BACKGROUND OF INVENTION**

This invention is a Continuation-In-Part of U.S. patent application, Ser. No. 09/026/634, filed Feb. 20, 1998 now U.S. Pat. No. 6,112,981, which claims the benefit of U.S. Provisional Application Ser. No. 60/039,007, which was filed Feb. 25, 1997 now expired.

BACKGROUND OF THE INVENTION

This invention relates to retail fuel dispensers and more particularly, to a promotional system utilized in conjunction with a fuel dispenser that will allow promotional discounts and other marketing type offerings to be provided to a consumer based on the customer's purchasing habits.

For more than a decade, retail fuel dispensers have included magnetic strip card readers for reading magnetic strip debit/credit cards. The magnetic strip cards are typically small plastic cards that contain a strip of magnetic material (i.e., magnetic data) that includes information such as an account number and a credit or debit facility (e.g., a bank).

However, many retailers, such as those used by various wholesale food clubs or video stores, have an established customer base that uses bar coded cards. Bar coded cards are also typically small plastic cards, but instead of having a magnetic strip, they contain bar codes (i.e. optical data) that identify a certain account with the retailer. These bar coded cards allow the retailers to provide many benefits, such as providing customers with frequent shopper awards, preventing unauthorized use, providing certain purchase discounts, and identifying an internal payment account.

A problem arises when these retailers, with an established customer base with bar coded cards, wish to sell fuel using conventional fuel dispensers. Because conventional fuel dispensers cannot read bar coded cards, one solution is for the retailers to provide their customers with magnetic strip cards for purchasing fuel in addition to the bar coded card already in use. However, such a solution is not only expensive, it is undesirable for many customers to keep two cards for a single retailer.

Another solution is to require the customers to switch from the bar coded card to the magnetic strip card. This solution is impractical because so many bar coded cards are already in use and it would be very expensive to convert them. Also, many facilities of the retailers already include bar code readers that would require replacement.

Further, there is a growing trend for retailers to offer fuel dispensing facilities. For example, the popularity of "hyper-market" type retail stores or non-traditional retail petroleum marketers has increased dramatically over the past few years. Wal-Mart is a typical retailer that uses the hyper-market concept for providing a wide variety of goods and services at a single location. These goods and services have been expanded to now include on site fuel dispensing.

Conventional systems have been developed to identify and reward certain customer purchases by determining from predefined criteria when a customer has purchased certain items from a designated group and rewarding the customer based thereon. Further, rewards may be given based on customer loyalty, i.e. the number of purchases made at a particular store or the quantity of items purchased. One such type of conventional system is commercially available from Catalina Marketing International, Inc. of St. Petersburg, Fla.

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However, conventional customer rewards systems have not been expanded to include fuel dispensing systems. This is due, at least in part, to the fact that hyper-market operators have little control over the fuel dispensing apparatus installed at their facilities. More particularly, the fuel dispensing apparatus providers, such as the Wayne Division of Dresser Industries, Gilbarco and Tokheim control the interface into the pumping system and thus do not provide an externally available interface that will allow the fuel price to be dynamically adjusted in accordance with customer purchases.

Therefore, it can be seen that a system and method that integrates a customer purchase reward system with a fuel dispensing apparatus would be highly desirable. In this manner, the retailer can reward and encourage customer loyalty, and the fuel provider may attract new customers that would not normally purchase their fuel without the incentive of a discounted price.

SUMMARY OF THE INVENTION

The present invention couples a customer reward data processing system with a fuel dispensing apparatus to allow a retailer to authorize discounted fuel or other marketing promotions in accordance with a customer's achievement of predefined purchasing criteria.

Broadly, a data processing system is provided that implements customer rewards and includes a database that creates and maintains records associated with customers that make purchases at an associated store. The reward system will track the customer purchases and compare them with a predefined criteria to determine when a fuel discount is to be provided. These predefined criteria may include whether the customer purchased items from a group of designated products (e.g. promotional items) exceeded a quantity threshold, a dollar value threshold, made purchases made on specific dates, or the like.

When a customer meets one of the predefined criteria, the reward system will authorize a fuel discount or reward and provide the customer with a mechanism to obtain the discounted fuel. This mechanism can include a bar coded receipt, data on a magnetic stripe card, an authorization identification number sequence, or the like. The reward system also notifies a controller in the fuel dispensing apparatus that a discount fuel sale is authorized for a specific authorization code, as well as the amount of the discount, e.g. \$0.10 dollars per gallon.

When purchasing fuel, the customer inputs the received authorization code at the pump by scanning in the bar code from the receipt, swiping a magnetic card, entering a code on a key pad, or the like. The pump controller then compares the customer entered authorization code with the code received from the reward system. The pump controller then adjusts the purchase price by subtracting the discount amount and allows the fuel to be dispensed at that rate for this transaction only. At this time a point of sale terminal associated with the fuel dispensing apparatus may also be notified of the adjusted fuel price.

Upon completion of the transaction, the controller notifies the reward system that the discount fuel has been purchased by the customer. The reward system then updates the record for this customer accordingly. This information is then available to the retailer that sets the purchasing criteria to use to develop new marketing strategies. That is, the retailer needs to know that a certain promotional activity is working in order to determine whether to continue with the existing purchase criteria or change the criteria to attract a larger number of customers.

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Therefore, in accordance with the previous summary, objects, features and advantages of the present invention will become apparent to one skilled in the art from the subsequent description and the appended claims taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram of a fuel dispenser system embodying features of the present invention.

FIG. 2 is a diagram of a bar code wand used in the fuel dispenser system of FIG. 1.

FIG. 3 is a diagram of a card reader device used in the fuel dispenser system of FIG. 1.

FIGS. 4a and 4b are diagrams of another card reader device used in the fuel dispenser system of FIG. 1.

FIG. 5 is a diagram of another fuel dispenser system embodying features of the present invention.

FIG. 6 is an illustration of a receipt used in the fuel dispenser system of FIG. 5.

FIG. 7 is a diagram of a kiosk used with a conventional fuel dispenser system for implementing features of the present invention.

FIG. 8 is a block diagram of the components that can be utilized to implement the present invention which integrates a customer reward system with a fuel dispenser having a dynamically adjustable price.

FIG. 9 is an example of a record that could be used to track customer eligibility for fuel discount rewards in accordance with the present invention.

FIG. 10 is flowchart of the process implemented by the present invention to encourage customer loyalty by providing discount fuel based on predefined purchase criteria.

DETAILED DESCRIPTION

In FIG. 1, the reference numeral 10 designates a fuel dispenser system embodying features of one embodiment of the present invention. The fuel dispenser system 10 includes a fuel dispenser 12, which contains many elements of a conventional fuel dispenser such as a fuel nozzle 14 connected to a fuel supply (not shown). The dispenser 12 has a front side 16 and a back side 18. In the following description, only the front side 16 will be discussed for ease of description. However, the features described herein may also be applied on the back side 18, thereby allowing the dispenser to be operated by two customers at the same time.

The front side 16 houses a conventional graphics displays 20a, 20b and a reader device 22 embodying features of the present invention. The graphics displays 20a, 20b each include a large, conventional, LCD panel for showing text and numerals, such as a price 24 that corresponds to an amount of fuel dispensed, or other customer-related messages. The reader device 22 includes magnetic strip reading circuitry connected to a controller 26 through a cable 28 such as an RS232 serial data bus. For the sake of example, the controller 26 controls the reader device 22 as well as other functions of the dispenser 12, such as a controller that includes a Customer Activated Terminal ("CAT") computer produced by the Wayne Division of Dresser Industries. Both the controller 26 and the cable 28 are conventional devices housed inside the dispenser 12. It is understood that the reader device 22 and controller 26 continue to provide conventional magnetic strip reading functions in addition to the functions and features herein described.

The controller 26 is also connected to a computing center 30 through a bus 32. In one embodiment, the computing

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center 30 is remotely located inside a store (not shown) or at an unattended site where it may be readily accessed. The computing center 30 includes a point-of-sale ("POS") controller 34. The POS controller 34 includes many features of a conventional electronic cash register, such as a keyboard 36, a display 38, a database 40, a cash drawer 42, and an internal card reader device 44, for use by an operator in charge of overseeing and maintaining the dispenser system 10. It is understood that the database 40 may be remote, and is shown with the POS 34 for ease of description. Also, the POS controller 34 may be in communication with other systems or devices, such as a carwash facility 46.

The database 40 contains a collection of records pertaining to its customers. For example, the store may be a member-oriented retail outlet, and a record for each customer indicates that the customer is a member and a "level" of benefits or privileges that the customer may receive. One level may indicate a first discount to the customer of the goods he purchases while another level may indicate a second discount. The POS controller 34 can thereby receive information from the controller 26, access the database 40, and return control codes which indicate, for example, membership status, level of benefits, or an "OK" signal to allow fuel dispensing.

Referring to FIG. 2, the controller 26 is also connected to one end of a bar code detector 60 with a second cable 62. The bar code detector 60 is a standard, decoded-type handheld stationary beam bar code reader such as the Welsh Allyn model Scanteam ST6180 reader. The bar code detector 60 also includes, at the end opposite the second cable 62, a photo detector 64 and a light source 66. The photo detector 64 may be a photo cell, photo diode or photo transistor, while the light source 66 may be a light emitting diode.

Referring to FIG. 3, the reader device 22 is surrounded by a housing 68 and a hole 70 is established on a side face 71 of the housing near a front face 72. The hole 70 extends to a slot 74 used for receiving cards such as debit/credit cards, but is separated from the slot by a small plastic or glass window (not shown). As a result, the hole 70 does not interfere with any pre-existing circuitry of the reader device 22. The hole 70 is also of sufficient size for viewing one bit of bar coded data at a time. The bar code detector 60 is inserted into the reader device 22 through the hole 70 so that the end with the cable 62 hangs out of the hole. In this way, the photo detector 64 is installed behind the small window and may access cards slid into and out-of the slot 74.

In operation, the reader device 22 receives a bar coded card 80. As the bar coded card 80 is slid into the slot 74, light from the light source 66 reflects off the bar coded card 80 so that the photo detector 64 can sequentially read bits of optical (bar coded) data 82 stored on the card. The bar code detector 60 interprets the bar coded data 82 and converts it into ASCII data, which it transmits to the controller 26 through the cable 62. Firmware in the controller 26 detects the presence of the ASCII data and processes it into electronic data, a method similar to that used to process magnetic strip cards. The controller 26, FIG. 1, then transmits the electronic data to the POS controller 34 through the bus 32. The POS controller 34 uses the electronic data in order to secure payment in accordance with the data, such as by forwarding the electronic data to a credit card processing network (not shown) for authorization and/or charging the sale to an account associated with the electronic data. The POS controller 34 then returns one or more control codes that direct the controller 26 to allow fuel to dispense and potentially, to indicate any discounts to be provided.

In another embodiment, FIGS. 1 and 2, the bar coded data 82 is processed by the POS controller 34 and a local billing

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file is established for billing the customer later. It is also possible for the POS controller 34 to have a local negative file of all invalid account numbers or a local positive file of all valid card numbers. In such cases the electronic data could be kept and billed locally, or forwarded in "batches" to another computer on-site or off-site for billing. The electronic data provided by the bar code detector 60 can also be differentiated from electronic data conventionally read from a magnetic strip card by the reader 22. This differentiation may, for example, be used for frequent shopper tracking and awards, or for providing a price discount, described in greater detail below.

Referring to FIGS. 4a and 4b, in another embodiment, a reader device 90 is used in place of the reader device 22 (FIG. 3). Instead of having the roundish hole 70 for the wand of the bar code detector 60, the reader device 90 includes a rectangular-shaped window 92 for simultaneously viewing all of the bar coded data. The window 92 allows a scanning bar code reader 94, such as Symbol model LS1220-1300A produced by Symbol Technologies, Inc., to read the bar coded data 82 on the card 80. The scanning bar code reader 94 has many of the same components as the bar code detector 60, but is advantageous because it moves its light source (not shown) in multiple directions, thereby increasing its ability to read bar coded data. Also, as is the case for the reader device 22 of FIG. 3, the reader device 90 includes conventional magnetic strip circuitry 95 and a magnetic strip reader 96 to read conventional magnetic strip data.

In operation, the reader device 90 receives the card 80. The card 80 has the bar coded data 82 and may also include magnetic strip data 104 stored thereon. The reader device 90 reads the magnetic strip data 104 in a conventional manner with the magnetic strip reader 96 and reports it to the controller 26 through the cable 28, as is done in the device 22 (FIG. 3). To read the bar coded data 82, the card 80 is slid into a slot 106 of the device 90 until the bar coded data 82 is fully exposed in the window 92. Light from the light source of the scanning bar code reader 94 reflects off the bar coded data 82, thereby allowing the reader to read the data. The scanning bar code reader 94 interprets the bar coded data 82 and converts it into ASCII data, which it then transmits to the controller 26 through the cable 62. Firmware in the controller 26 detects the presence of the ASCII data and processes it into electronic data, a method similar to that used to process magnetic strip cards and described with reference to FIG. 3, above. It is understood that different combinations of bar coded and magnetic strip data are expected, and the card 80 is meant to illustrate only some of the combinations. In typical operation, a successful product scan is acknowledged by an audiovisual signal by connection to the POS controller 26.

A benefit of the modified reader devices 22, 90 is that their modification can be done very easily, while maintaining full functionality of the remaining components. Also, the modification can be sold as a kit to simply replace the previous, conventional magnetic-strip-only reader devices with the improved devices 22, 90. Other modifications can easily be supported, such as using a single cable instead of two cables 28, 62, or sharing some or all of the circuitry 95 for use in bar coded and magnetic data interpretation.

Referring to FIG. 5, the reference numeral 110 refers to a fuel dispenser system embodying features of another embodiment of the present invention. The fuel dispenser system 110 contains a fuel dispenser 112 connected to the computing center 30 and many components similar to those in the fuel dispenser system 10 (FIG. 1), such components being similarly numbered.

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A front side 116 houses the conventional graphics displays 20a, 20b and (optionally) a conventional magnetic-strip-only reader device 118. The front side 116 also houses a scanning bar code reader 120. The magnetic strip reader device 118 and scanning bar code reader 120 are connected to the controller 26 through cables 28, 62 respectively. The scanning bar code reader 120 is similar to the reader 94 (FIGS. 4a, 4b) in that it moves its light source (not shown) in multiple directions, thereby increasing its ability to read bar coded data. By being placed directly on the front side 116, the scanning bar code reader 120 realizes several additional benefits discussed in greater detail, below.

In operation, the bar coded card 80, discussed above, may simply be placed or waved in front of the scanning bar code reader 120. At this time, light from the light source projected from the scanning bar code reader 120 reflects off the bar coded card 80 so that a photo detector (also not shown) can read the bar coded data 82. The scanning bar code reader 120 interprets the bar coded data 82 and converts it into ASCII data (or data in any other suitable format), which it transmits to the controller 26 through the cable 62. Firmware in the controller 26 detects the presence of the data and processes it into electronic data, a method similar to that used with the bar code reader 60 and described with reference to FIG. 3, above.

Referring to FIG. 6, another benefit provided by the scanning bar code reader 120 is that it can read bar coded data from items other than bar coded cards. The reference numeral 130 designates a paper receipt with bar coded data 132 printed thereon. The receipt 130 may also be placed or waved in front of the scanning bar code reader 120, as described above with reference to FIG. 5.

Referring to FIG. 7, in another embodiment, a separate system, such as a kiosk 140, may be provided to interface with one or more conventional fuel dispensers 142. The kiosk 140 includes a scanning bar code reader 144, a display screen 146, and a keypad 148. The kiosk 140 is in communication with the computing center 30, discussed above, which in turn is in communication with the controller 26 of the conventional dispenser 142. By using the kiosk 140, the features of the present invention may be achieved without physically modifying the fuel dispenser system 142.

Listed below are several examples of how the fuel dispenser systems described above may be used. It is understood that the functionality described below is interchangeable with the different systems, and is not meant to be an exhaustive list.

EXAMPLE A (FIGS. 5-6)

1. A customer enters a store and purchases, among other things, \$10 worth of gasoline.
2. The store gives the customer a receipt (similar to the receipt 130) which includes a description of the purchases and bar coded data (similar to bar coded data 132) indicating the prepaid \$10 amount.
3. The customer places the receipt in front of the scanning bar code reader 120 and then operates the fuel dispenser 110 to dispense \$10 worth of gas.

EXAMPLE B (FIGS. 5-6)

1. A customer enters a store and purchases several items.
2. The store, which has a reward program that gives free gasoline, gives the customer a receipt (similar to the receipt 130) having bar coded data (similar to bar coded data 132) indicating a free \$1 worth of gasoline.

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3. The customer collects four more receipts over several visits to the store, each indicating a free \$1 worth of gasoline.
4. The customer sequentially places the five receipts in front of the scanning bar code reader **120**, and then operates the fuel dispenser **110** to dispense \$5 worth of gas.
5. The customer also inserts a magnetic strip credit card into the magnetic strip reader device **118** to allow an additional amount of gasoline to be dispensed. A charge for the additional amount is reported to a credit agency identified by the magnetic strip credit card.

EXAMPLE C (FIG. 7)

1. A customer obtains a bar coded card (similar to the card **80**) indicating a "member" status (e.g., the customer is eligible for certain benefits).
2. The customer places the card near the scanning bar code reader **144** of the kiosk **140**. The card identifies an account and an appropriate benefit (e.g., a 10¢ per gallon discount).
3. The customer enters on the keypad **148** a number identifying the fuel dispenser **142**.
4. The customer operates the fuel dispenser **142** to dispense gasoline and the account is credited for the purchase (adjusted by the 10¢ per gallon discount).

EXAMPLE D (FIGS. 1-3)

1. A customer obtains a bar coded card (similar to the card **80**) which identifies a first account for a store and a conventional magnetic strip credit card which identifies a second account with a bank.
2. The customer approaches the fuel dispenser **12** associated with the store and places the bar coded card into the reader **22**.
3. The customer then places the magnetic strip credit card into the reader **22**.
4. The customer operates the fuel dispenser **12** to dispense gasoline and the second account is credited for the purchase.
5. The store records a data record in the first account of the customer's fuel purchase.
6. Steps 2-5, above, are repeated four more times.
7. The fuel dispenser **12** displays on the screen **20b** a message:

BECAUSE YOU HAVE PURCHASED FUEL HERE
FIVE TIMES IN THE LAST THIRTY DAYS, YOU
MAY HAVE A COMPLIMENTARY CAR WASH

- and provides the customer with a predetermined number.
8. The customer drives to the nearby carwash facility **46** and enters the predetermined number on an attached keypad (not shown).
 9. The carwash facility **46** interprets the predetermined number to identify that the customer has a complimentary carwash and performs the carwash service.

It should be noted that the carwash facility **46** described in Example D above may also have a bar code reader connected to the computing center **30**. In this way, the carwash facility **46** may provide similar functions as those described above with the reader **22**. Also, the carwash

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facility **46** and fuel dispenser **12** may be in communication so that instead of providing a predetermined number, a record associated with the bar coded card is stored indicating the complimentary carwash.

- 5 Referring to FIG. **8**, a block diagram of the components included in a preferred embodiment are shown and will now be described. A market point of sale (POS) terminal **200** is shown that may be located in a retail store, or the like. For example a Wal-Mart store is one type of retail outlet that may include a POS **200** in accordance with the present invention. Reference numeral **201** represents an item to be purchased by a customer in the retail store including POS **200**. It is the usual case that each item will include stock keeping unit (SKU) number, as well as a Universal Purchase Code (UPC) that is provided as an optically scannable bar code **202**. When purchasing the item **201**, a customer will present the item at POS **200** where it will be scanned in or otherwise entered.

A server data processing system **204** is shown and coupled with POS **200**. Server **204** may be a commercially available workstation computer from one of the various computer manufacturers, such as Compaq Computer, IBM Corporation, Hewlett Packard, or the like. A database **206** is linked to server **204** and includes multiple records **208** that correspond to customers purchasing items through POS **200**. It should be noted that many POS terminals **200** are contemplated as being connected to server **204** and may be distributed remotely across more than one store. Server **204** will include software that manages the transactions occurring on POS **200**, as well as the records **208** in database **206**. In a preferred embodiment, database **206** may be magnetic storage media, optical storage or the like.

Upon completion of a purchase transaction at POS **200**, the customer (if eligible) will be provided with a mechanism **210** that will allow discounted fuel to be purchased at pump **112**. That is a receipt, such as receipt **130**, discussed above, having a bar code **132** thereon may be provided to the customer. Additionally, a card with a magnetic stripe may be updated by POS **200** with information authorizing a fuel discount. Further, an identification code may be provided to the customer which can then be entered on a keypad included in the pump input/output I/O device **212**. It will be understood that I/O device **212** may also include a magnetic card reader **118**, bar code reader **120**, or the like. Pump **112** also includes controller **26** that is electrically coupled to server **204** and printer **214**. Controller **26** includes a micro-controller that processes and controls the various activity at pump **112**. Peripheral interface board (PIB) **216** or other device is included in a preferred embodiment to provide an interface between server **204** and controller **26**. PIB **216** allows the control signal output by server **204** to be interpreted by controller **26**. That is, PIB **216** receives the control signal from server **204** with the authorization code and the unit price discount offered to the customer. Interface board **216** will then issue an command to controller **26** to map the discount amount to each of the fueling point product select positions, i.e. regular, premium, etc. In one example, the discount value range may be encoded as an eight bit value to give **256** different discount amounts. In this manner, the server **204** will be able to authorize a price discount, PIB **216** will then issue a command compatible with controller **26** to cause pump **112** to dispense fuel at the discounted unit price.

It should be noted that while a single retail store and corresponding fuel dispensing facility have been shown in FIG. **8** and described above, the present invention contemplates the situation where an entire chain of stores or related stores may be interconnected such that any one of their POS

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terminals can be connected to a server through a network. Further, numerous fuel stations can also be coupled to a server to allow discounted fuel in response to customer purchases at one of the associated stores. For example, Wal-Mart and Starbucks may form an alliance such that purchases from one or the other (or both) stores can cause fuel discounts to be made available. A POS terminal in either store can be coupled to a server that maintains customer records. Also, fuel companies can also form alliances such that Texaco and Mobil can have their pump controllers connected to the same server. In this manner a customer may be entitled to fuel at a reduced unit cost based on purchases made at any Wal-Mart or Starbucks store nationwide, and be able to redeem that discount at any Texaco or Mobil station independent of geographic location. Further, it can be seen that with the Internet it is possible to connect virtually any retailer wishing to offer discounted fuel based on predefined purchase criteria with virtually any fuel station without geographic boundary. Discounts may also be offered for purchase of items other than fuel, such as in the case of a POS **30**, discussed above, located at a convenience store or other retailer.

FIG. **9** is a more detailed view of the fields that may be included in record **208** corresponding to a particular customer, e.g. A. Smith. As shown in field **300** of FIG. **9**, the customer name is provided along with an identification number. For new customers, or when the system of the present invention is first installed, a record will be created when the first item is purchased at POS **200**.

The date of purchase when at least one item was purchased at POS **200** of an associated retailer is provided in field **302**. The dollar value of the purchases is listed in field **304**. Retailers may often designate various items to trigger discounts related to competing or related items. The quantity of these designated, or trigger items, that were purchased on each date (if any) are provided in field **306**. As an example of a trigger item, a certain brand of baby formula may be purchased which will cause a coupon to be generated for a competing baby formula. Also, complementary items may be used as trigger items. That is, the purchase of cereal may trigger a coupon for a discount on milk.

Field **308** is the total quantity of items purchased by a certain customer on a specific date. This field, along with field **304** can be used as a criteria for determining customer loyalty. Field **310** will include data representing the availability of a fuel discount. The record will be updated in field **312** when a discount is actually used by a customer and the discount amount is provided in field **314**. Fields **316**, **318** and **320** provide totals for the dollar value fields **304**, designated items purchased **306** and total quantity **308**, respectively.

As an example, when A. Smith purchases \$20 of merchandise on Jan. 5, 1999, record **208** is created by server **204** and stored in database **206**. At that time three (3) designated items were purchased out of a total quantity of five (5) items. These purchases did not meet the established criteria that would cause a discount on fuel to be made available.

Then, on Jan. 17, 1999, A. Smith purchased five designated items, 10 total items for \$15.00. This purchase will cause the total designated item purchase by this customer to exceed five and cause a fuel discount to be offered. Thus, field **310** will indicate that a fuel discount was offered to A. Smith on Jan. 17, 1999. The discount amount is noted as \$0.10 per gallon in field **314**. As noted above, the mechanism by which the discount is offered may be a receipt with a bar code, updated magnetic card, alphanumeric authorization code, or the like.

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Further, record **208** shows that this customer took advantage of the discount and used it to purchase fuel on Jan. 20, 1999. It will be understood that this data can then be analyzed to determine the success of the discount program. That is, the predefined purchase criteria can be adjusted as needed to provide the discount for different items, different quantities of the items or a different discount amount.

Returning to the current example, A. Smith returns to the associated store and purchases additional items on Jan. 28, 1999, totaling \$45.00. However, at this time A. Smith has not reached the next purchasing criteria threshold that will cause discounted fuel to be offered.

On Feb. 4, 1999, A. Smith once again purchases items from this, or another participating store. This purchase causes the total purchases to exceed \$100.00. Also, A. Smith purchased three total items that caused the total quantity of merchandise purchased at this store to be greater than 20 items. In this example, exceeding both of these criteria will trigger a fuel discount. That is, purchasing greater than 20 items within a month will cause a \$0.10 fuel discount to be offered and exceeding \$100.00 in total purchase price will cause a \$0.15 fuel discount. Those skilled in the art will understand that the fuel discount system of the present invention can be designed to offer the highest discount of the two, e.g. \$0.15 per gallon, the lowest discount \$0.10, an average of the two, or add the discounts and offer a \$0.25 per gallon discount to the customer. In any event, it can be seen that information provided in record **208** can be used to monitor a customers status relative to being offered discounted fuel and to determine when such offer is to be made to the customer.

Of course, those skilled in the art will appreciate that many other types of data may be used in addition to, or instead of the various information discussed as an example with regard to FIG. **9**. And, it should be understood that the scope of the present invention contemplates such additional information.

FIGS. **10A**, **10B** and **10C** are flowcharts showing the process implemented by the present invention to cause fuel discounts to be made available to eligible customers.

Referring to FIG. **10A**, at step **400** the process is started and the customer purchases items at step **401** where the identification code for the purchased items is entered at POS **200**. The customer identity is also entered by using a member club card, personal identification number (PIN), or the like, such that an associated record can be created or updated. The data relating to the purchased items is then provided by POS **200** to server **204**, at step **402**. Server **204** then analyzes the customer record (step **403**). That is, server **204** will create a record for a new customer or maintain an existing record by updating it with current purchases for customers already having a record.

At step **404** a determination is made as to whether the current purchases will cause a fuel discount to be offered. As noted above this step may include determining if the customer has purchased certain designated items that will trigger a discount, whether a total dollar value spent exceeds a predefined threshold and/or if a total quantity of items exceeds a threshold.

If at step **404** it is determined that the customer has not yet earned a fuel discount, then the method proceeds to step **413** and ends. However, if at step **404** it is determined that a fuel discount is available, then at step **405** the server authorizes the discount and sends a signal to the market POS termination **200**. At step **406**, a bar coded discount coupon, alphanumeric authorization code, updated magnetic card or other mechanism is provided to the customer. At step **407**, server

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204 sends an authorization signal to PIB 216, which then provides corresponding commands to controller 26 in pump 112. The signal from server 204 will include an authorization code and a discount amount. The customer then inputs the fuel discount authorization code from POS 200 at pump 112 in step 408. More particularly, the customer may swipe a magnetic card, scan in a bar code from a receipt of key in an alphanumeric code at I/O 212 of pump 112. After the customer authorization code is entered the process then compares (step 408a) the authorization code from server 204 with the code from the customer and if a match exists then proceeds to step 409 and adjusts the price of the fuel to be dispensed for this transaction. However, if a match does not occur at step 408a, then an error has occurred or an unauthorized customer is attempting to obtain discounted fuel. When no match occurs the process continues to step 413 and ends without allowing discounted fuel to be dispensed. Of course, those skilled in the art will understand that it is possible to send a notification signal to server 204, gas station POS 34 or another terminal when a match does not occur to indicate a potentially fraudulent user may be attempting to obtain discounted fuel.

At step 410, pump controller 26 notifies gas station POS 34 of the adjusted fuel price such that the fuel sales records will be in order and to ensure that the customer is correctly charged the discounted fuel price. Next, at step 411 pump controller 26 notifies server 204 of completion of the transaction for discounted fuel and readjusts the fuel price to its normal level by mapping the discount amount to zero. Server 204 then updates the customer record 208 in database 206 to reflect that the discount was used. Subsequent to step 412, the process of the present invention continues to step 413 and ends.

Of course, many other configurations are contemplated by the present invention. For example, gas station POS 34 can also be a source of discounted gas. That is, POS 34 may be in a convenience store that also desires to develop customer loyalty by providing fuel discounts. In this scenario, a customer may purchase a certain volume of gas or other items such as candy bars and coffee which triggers a discount in the price of fuel. Authorization can then be provided directly to PIB 216 from POS 34 to adjust the unit price of fuel dispensed from pump 112. Additionally, the authorization could be sent to server 204 to update or create customer record 208.

Further, the purchase of fuel at full price could also be used to trigger discounts on items in the retail store having POS 200. For example, when a customer purchases fuel a signal can be sent from controller 26 to PIB 216 to server 204 which then updates and analyzes the customer's record (or creates a record if none exists). If the customer has purchased fuel in excess of a predetermined value (dollar) or quantity (gallons) threshold, then a signal can be sent from server 204 back to controller 26 via PIB 216, to authorize a discount for this customer on merchandise to be purchased at a participating store. More particularly, a bar coded receipt can be printed by printer 214 that the customer can then take to the participating store and redeem for a discount on one or more items purchased as POS 200. When purchased, a signal will be sent to server 204 and the customer record will be updated accordingly.

Other arrangements are also contemplated to implement discounts at the fuel dispensing system or associated store.

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For example, the mechanism 210 may not be needed if other means are provided to identify the customer at either the market POS 200 or the POS 30. In one example, a customer card or number used at the market POS 200 may similarly be used at the gas station POS 30 such that the customer's discount can be automatically applied at the POS 30. Identification may also be accomplished by an initial registration procedure whereby a customer card/number may be matched with the credit or debit account of the customer that the customer utilizes to make purchases at the POS 30. In one example, transponder technology may be utilized at one or both of the market POS 200 or gas station POS 30 to properly identify the customer. Furthermore, the barcode may have some form of embedded security identification information for authenticating the purchase. In other configurations, the peripheral interface board may not be required. Pertaining to the discounts, a variety of arrangements are contemplated. Some examples entail the funding of the discount or reward by third parties other than the supplier of petroleum. Other discounts are offered in the form of a club discount or volume discount. The controller utilized may be any type of hardware device with software programming to implement the intended functions. Although certain preferred embodiments have been shown and described it should be understood that many changes and modifications may be made therein without departing from the scope of the appended claims.

What is claimed is:

1. A system for dispensing fuel, comprising:

a nozzle for dispensing the fuel;

a controller in communication with the nozzle for selectively causing the nozzle to dispense the fuel at a discounted unit price;

a reader connected to the controller for reading data provided by a user and transferring the data to the controller; and

a database for creating and maintaining a record associated with purchases made by the user, the record including the users achievement of a purchasing criteria;

whereby upon receipt of the data, the controller accesses said record and causes the nozzle to dispense the fuel at the discounted unit price associated with the users achievement of the purchasing criteria.

2. A system according to claim 1 wherein said purchasing criteria is encoded into said data.

3. A system according to claim 2 wherein said data comprises optical data.

4. A system according to claim 3 wherein said optical data comprises a bar code included on a receipt provided to the user by a point of sale controller.

5. A system according to claim 1 wherein said reader is capable of reading optical data.

6. A system according to claim 5 wherein said user scans said bar code into said reader and updates said record with the discounted unit price associated with the user based on the purchasing criteria.

7. A system according to claim 6 wherein said purchasing criteria comprises:

a volume of goods purchased by said user;

a volume of services purchased by said user;

a certain type of goods purchased by said user;

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a certain type of services purchased by said user; and
a specific quantity of goods or services purchased by said
user over a certain time period.

8. A system according to claim 1 wherein said data
comprises magnetic data. 5

9. A system according to claim 8 wherein said magnetic
data comprises a magnetic strip included on a card updated
by a point of sale controller.

10. A system according to claim 9 wherein said magnetic 10
data is dependent on purchases made by said user.

11. A system according to claim 10 wherein said reader is
capable of reading magnetic data.

12. A system according to claim 11 wherein said user 15
inserts said card into said reader and updates said record
with the discounted unit price associated with the user.

13. A system according to claim 12 wherein said purchas-
ing criteria comprises:

- a volume of goods purchased by said user; 20
- a volume of services purchased by said user;
- a certain type of goods purchased by said user;
- a certain type of services purchased by said user; and
- a specific quantity of goods or services purchased by said
user over a certain time period.

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14. A system for dispensing fuel, comprising:

a nozzle for dispensing the fuel;

a controller in communication with the nozzle for selec-
tively causing the nozzle to dispense the fuel at a
discounted unit price;

a reader connected to the controller for reading identifi-
cation data provided by a user and transferring the
identification data to the controller; and

a database for creating and maintaining a record associ-
ated with purchases made by the user, the record
including the users achievement of a purchasing crite-
ria;

whereby upon receipt of the identification data, the con-
troller accesses said record and causes the nozzle to
dispense the fuel at the discounted unit price associated
with the users achievement of the purchasing criteria.

15. A system according to claim 14 further comprising a
point of sale controller coupled to said database, wherein the
record is modified to specify the discounted unit price of said
fuel based on purchases made by said user.

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